



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF  
CHEMICAL SAFETY AND  
POLLUTION PREVENTION

**MEMORANDUM**

DATE: 22-AUG-2013

SUBJECT: **Triflumizole.** Acute and Chronic Dietary (Food and Drinking Water) Exposure and Risk Assessments for Greenhouse Uses on Tomato and Cucumber; Translations of Apple and Pear to Pome Fruit Group 11-10, Grape to Crop Subgroup 13-07F, and Strawberry to Crop Subgroup 13-07G, Except Cranberry.

**PC Code:** 128879

**Decision No.:** 472282

**Petition No.:** 2E8119

**Risk Assessment Type:** Dietary

**TXR No.:** NA

**MRID No.:** NA

**DP Barcode:** D413699

**Registration Nos.:** 400-436, -518, -521

**Regulatory Action:** Section 3 Registration

**Case No.:** NA

**CAS No.:** 68694-11-1

**40 CFR:** §180.476

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**Executive Summary**

Acute and chronic aggregate dietary (food and drinking water) exposure and risk assessments were conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID) Version 3.16. This software incorporates 2003-2008 food consumption data from the U.S. Department of Agriculture's (USDA's) National Health and Nutrition Examination Survey, What We Eat in America (NHANES/WWEIA). The analyses were conducted in support of a human health risk assessment for the proposed Section

3 uses of triflumizole on greenhouse cucumber and tomato, Crop Group 11-10 [Pome fruit], Crop Subgroup 13-07F [Small fruit vine climbing, except fuzzy kiwifruit subgroup], and Crop Subgroup 13-07G, except cranberry [Low-growing berry subgroup, except cranberry]. This memo was reviewed by two members of the DESAC, per the current DESAC SOP.

#### Acute Dietary (Food and Drinking Water) Exposure Results and Characterization

A conservative acute dietary assessment was conducted using tolerance-level residues, 100% crop treated assumptions, and modeled water estimates. At the 95<sup>th</sup> percentile of exposure, the estimated risk is  $\leq 66\%$  of the acute population adjusted dose (aPAD) for the U.S. population and all population subgroups.

#### Chronic Dietary (Food and Drinking Water) Exposure Results and Characterization

A partially refined chronic dietary assessment was conducted using average residues from supervised field trials, percent crop treated information, and modeled water estimates. The estimated risk is  $\leq 39\%$  of the chronic population adjusted dose (cPAD) for the U.S. population and all population subgroups.

#### Cancer Dietary Exposure and Characterization

Triflumizole is classified as “Not likely to be Carcinogenic to Humans” based on the absence of significant tumor increases in two adequate rodent carcinogenicity studies. Therefore, a cancer dietary exposure analysis is not required.

## **I. Introduction**

Dietary risk assessment incorporates both exposure and toxicity of a given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose (i.e., the dose which HED has concluded will result in no unreasonable adverse health effects). This dose is referred to as the population adjusted dose (PAD). The PAD is equivalent to the point of departure (POD, NOAEL, LOAEL, e.g.) divided by the required uncertainty or safety factors.

For acute and chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. References which discuss the acute and chronic risk assessments in more detail are available on the EPA/pesticides web site: “Available Information on Assessing Exposure from Pesticides, A User’s Guide,” 21-JUN-2000, web link: <http://www.epa.gov/fedrgstr/EPA-PEST/2000/July/Day-12/6061.pdf>; or see SOP 99.6 (20-AUG-1999).

The most recent dietary risk assessment for triflumizole was conducted by W. Donovan (D397935, 28-MAR-2012).

## II. Residue Information

**Established and Recommended Tolerances:** Permanent tolerances for residues of triflumizole, including its metabolites and degradates are established under 40 CFR §180.476(a)(1) for plants and under 40 CFR §180.476(a)(2) for livestock commodities. Compliance with the tolerance levels under 40 CFR §180.476(a)(1) is to be determined by measuring only the parent and its metabolites containing the 4-chloro-2-trifluoromethylaniline moiety, calculated as the parent compound, in/on the crops listed in Table 1. Compliance with the tolerance levels under 40 CFR §180.476(a)(2) is to be determined by measuring only the parent, the metabolite 4-chloro-2-hydroxy-6-trifluoromethylaniline sulfate, and other metabolites containing the 4-chloro-2-trifluoromethylaniline moiety, calculated as the parent compound, in/on the fat, meat, and meat byproducts of cattle, goats, hogs, horses, poultry, and sheep; milk, , and eggs. However, based on the cattle feeding study and revisions from the *Table 1 Feedstuffs* (June 2008), livestock tolerances are appropriate only for meat byproducts and fat of cattle, goats, horses, and sheep (D354063, W. Cutchin, 10/1/08). Consequently, the present analyses were based on the recommended tolerances listed in Table 1 instead of the established tolerances for livestock commodities.

**Table 1. Tolerance Summary for Triflumizole.**

Commodity	Established Tolerance (ppm)	Recommended Tolerance (ppm)	Comments <i>Correct Commodity Definition</i>
<b>Plant Commodities § 180.476(a)(1)</b>			
Apple	0.5	--	In group 11-10
Apple, dry pomace	2.0	--	Not a regulated feedstuff
Apple, wet pomace	2.0	--	No residue concentration
Brassica, head and stem, subgroup 5A	8.0	8.0	
Brassica, leafy greens, subgroup 5B	40	40	
Canistel	2.5	2.5	
Cherry, sweet	1.5	1.5	
Cherry, tart	1.5	1.5	
Cilantro, leaves	35	35	<i>Coriander, leaves</i>
Fruit, pome, group 11-10	--	0.5	Extrapolated from apple, pear
Fruit, small vine climbing, except fuzzy kiwifruit, subgroup 13-07F	--	2.5	Extrapolated from grape
Berry, low growing, subgroup 13-07G, except cranberry	--	2.0	Extrapolated from strawberry
Grape	2.5	--	In group 13-07F
Grape, dried pomace	15	--	Not a regulated feedstuff
Grape, raisin, waste	10	--	
Grape, wet pomace	15	--	
Hazelnut	0.05	0.05	
Hop, dried cones	50	50	
Leafy greens subgroup 4A, except spinach	35	35	
Mango	2.5	2.5	
Papaya	2.5	2.5	
Pear	0.5	--	In group 11-10
Pineapple	4.0	4.0	

**Table 1. Tolerance Summary for Triflumizole.**

Commodity	Established Tolerance (ppm)	Recommended Tolerance (ppm)	Comments <i>Correct Commodity Definition</i>
Pome fruit, group 11-10	--	0.5	
Sapodilla	2.5	2.5	
Sapote, black	2.5	2.5	
Sapote, mamey	2.5	2.5	
Star apple	2.5	2.5	
Strawberry	2.0	--	In subgroup 13-07G
Swiss chard	18	18	
Tomato	--	1.5	Greenhouse only
Turnip, greens	40	40	
Vegetable, cucurbit, group 9	0.5	0.8	Increased level due to greenhouse cucumber field trial data
<b>Livestock Commodities § 180.476(a)(2)</b>			
Cattle, fat	0.5	0.1	Tolerances for fat, meat and meat byproducts of hog and poultry; meat of cattle, goat, horse, and sheep; milk, and egg should be deleted.
Cattle, meat	0.05	--	
Cattle, meat byproduct	0.5	0.2	
Egg	0.05	--	
Goat, fat	0.5	0.1	
Goat, meat	0.05	--	
Goat, meat byproduct	0.5	0.2	
Hog, fat	0.5	--	
Hog, meat	0.05	--	
Hog, meat byproduct	0.5	--	
Horse, fat	0.5	0.1	
Horse, meat	0.05	--	
Horse, meat byproduct	0.5	0.2	
Milk	0.05	--	
Poultry, fat	0.05	--	
Poultry, meat	0.05	--	
Poultry, meat byproduct	0.1	--	
Sheep, fat	0.5	0.1	
Sheep, meat	0.05	--	
Sheep, meat byproduct	0.5	0.2	

Since there are no longer any poultry or swine feed items of regulatory interest, the current tolerances on eggs; poultry fat, meat, and meat byproducts; and hog fat, meat and meat byproducts should all be deleted. Tolerances are required for meat byproducts and fat of cattle, sheep, goat, and horse, but below established levels. Specifically, the established fat tolerance levels should be lowered from 0.5 ppm to 0.10 ppm, and the meat byproduct tolerance levels should be lowered from 0.5 ppm to 0.20 ppm (D354063, W. Cutchin, 10/1/08). All other established livestock tolerances should be removed from 40 CFR § 180.476(a)(2).

**Nature of the Residue:** The nature of the residue in plants is adequately understood based on acceptable metabolism data on apples, cucumbers, grapes, and pears. The residues of concern include the parent compound, triflumizole and its metabolites (free and conjugates) containing the 4-chloro-2-trifluoromethylaniline moiety (calculated as triflumizole) (D280869, J. Tyler, 3/13/02).

The nature of the residue in livestock is adequately understood based on acceptable metabolism data on lactating goats and poultry. The residues of concern were determined to be the combined residues of triflumizole, the metabolite 4-chloro-2-hydroxy-6-trifluoromethylaniline sulfate, and other metabolites containing the 4-chloro-2-trifluoromethylaniline moiety, calculated as the parent compound (D280869, J. Tyler, 3/13/02).

Residue Data used for Acute and Chronic Assessments:

**Anticipated Residues:** Tolerance-level residues were used for all registered commodities in the acute assessment. For the chronic assessment, anticipated residues (ARs) calculated as the mean value from field trial data were used for apple, grape, pear, cherry, cucurbit vegetables, strawberry, leafy greens (subgroup 4A) except spinach, head and stem *Brassica* (subgroup 5A), cilantro, Swiss chard, pineapple, papaya, canistel, mamey sapote, mango, and hops. See Table 2 for a summary of the input values used in the present analysis.

<b>TABLE 2: Summary of Residue Values Used in the Dietary (Food + Drinking Water) Risk Assessments for Triflumizole</b>					
<b>COMMODITY<sup>1</sup></b>	<b>ACUTE ASSESSMENT</b>		<b>CHRONIC ASSESSMENT</b>		
	<b>Tolerance (ppm)</b>	<b>Processing Factors</b>	<b>AR<sup>2</sup> (ppm)</b>	<b>%CT<sup>3</sup></b>	<b>Processing Factors</b>
<b>Established Crop Commodities</b>					
Leafy greens subgroup 4A, except spinach	35	NA <sup>4</sup>	Head Lettuce 2.97 Leaf Lettuce 11.1	NR	NA
<i>Brassica</i> , head and stem, subgroup 5A	8.0	NA	Cabbage 0.74 Broccoli 1.79	NR	NA
<i>Brassica</i> leafy greens subgroup 5B <sup>5</sup>	40	NA	7.72	NR	NA
Muskmelons, subgroup 9A <sup>6</sup>	0.8	NA	0.17	10/15 <sup>8</sup>	NA
Summer squash, subgroup 9B <sup>6</sup>	0.8	NA	0.14	5	NA
Pome fruit, group 11-10	0.5	See Apple and Pear			
Small vine climbing fruit except fuzzy kiwifruit, subgroup 13-07F	2.5	See Grape			
Low growing berry, subgroup 13-07G, except cranberry	2.0	See Strawberry			
Cucumber (Greenhouse) <sup>7</sup>	0.8	NA	0.25	2.5	NA
Apple <sup>9</sup>	0.5	Juice – 1.0 Sauce – 1.0 Dried – 8.0	0.14	25	Juice – 1.0 Sauce – 1.0 Dried – 8.0
Pear <sup>9</sup>	0.5	Dried – 6.25	0.23	45	Dried – 6.25
Grape <sup>9</sup>	2.5	Juice – 1.0 Raisin – 1.0	0.55	5	Juice – 1.0 Raisin – 1.0
Cherry <sup>10</sup>	1.5	Juice – 1.5	0.66	25	Juice – 1.5
Coriander, leaves	35	NA	11.1	NR	NA

**TABLE 2: Summary of Residue Values Used in the Dietary (Food + Drinking Water) Risk Assessments for Triflumizole**

COMMODITY <sup>1</sup>	ACUTE ASSESSMENT		CHRONIC ASSESSMENT		
	Tolerance (ppm)	Processing Factors	AR <sup>2</sup> (ppm)	%CT <sup>3</sup>	Processing Factors
Hazelnuts (Filberts) <sup>11</sup>	0.05	NA	0.05	5	NA
Hop, dried cones	50	NA	14.4	NR	NA
Strawberry <sup>13</sup>	2.0	NA	0.53	25	NA
Swiss chard	18	NA	5.48	NR	NA
Pineapple	4.0	Juice – 1.0 Dried – 5.0	2.17	NR	Juice – 1.0 Dried – 5.0
Papaya	2.5	Juice – 1.5 Dried – 1.8	0.63	NR	Juice – 1.5 Dried – 1.8
Sapote, black	2.5	NA	0.63	NR	NA
Canistel	2.5	NA	0.63	NR	NA
Sapote, mamey	2.5	NA	0.63	NR	NA
Mango	2.5	NA	0.63	NR	NA
Sapodilla	2.5	NA	0.63	NR	NA
Star apple	2.5	NA	0.63	NR	NA
Tomato (Greenhouse) <sup>12</sup>	1.5	NA	0.59	NR	NA
<b>Recommended Livestock Commodities</b>					
Fat <sup>14</sup>	0.10	NA	0.10	NA	NA
Meat byproducts (Mby) <sup>14</sup>	0.20	NA	0.20	NA	NA

<sup>1</sup> Unless otherwise indicated, anticipated residue values were from: D346779, W. Cutchin, 01-OCT-2008.  
<sup>2</sup> Anticipated Residue: calculated as the mean value from field trial data  
<sup>3</sup> Percent Crop Treated from BEAD SLUA  
<sup>4</sup> NA – Not Available; NC – Not Calculated; NR – Not Reported  
<sup>5</sup> Subgroup 5B: D338653, J.R. Tomerlin, 07-DEC-2007.  
<sup>6</sup> D271003, J. Tyler, 11-MAR-2002.  
<sup>7</sup> MRID 48998101.  
<sup>8</sup> Percent crop treated of 10% was used for cantaloupes and percent crop treated of 30% used for honeydew melons. 100% CT was assumed for all other melons except watermelon (5%).  
<sup>9</sup> Apple, pear, and grape: MRID#s 407520-06 thru 407520-08; and 400185-07 thru 400185-09) were previously reviewed in the HED memos dated 3/16/89 (Memo, S. Malak; DEB#s 4277 and 4278) and 3/13/87 (Memo, R. Loranger).  
<sup>10</sup> Cherry: D242429, J. Tyler, 30-APR-2001.  
<sup>11</sup> Filbert: D312293, J. Tyler, 18-MAY-2005.  
<sup>12</sup> MRID 48998102.  
<sup>13</sup> Strawberry: D274589, J. Tyler, 11-MAR-2002.  
<sup>14</sup> Of cattle, goats, horses, and sheep.

No crop field trial data were submitted for cilantro, which is not currently a member of subgroup 4A. However, the proposed update to subgroup 4A includes fresh leaves for both parsley and cilantro (12/14/2011 ChemSAC Minutes). Because the commodity definition for parsley has been determined to be equivalent to cilantro (Reviewer's Guide, B. Schneider, 14-JUN-2002), and parsley is a member of subgroup 4A, data for head and leaf lettuce are adequate to support tolerances on parsley and cilantro leaves (D346779, W. Cutchin, 01-OCT-2008). Note that the preferred commodity terminology for cilantro is coriander.



DEEM does not include a default processing factor for parsley, dried leaves. To account for the potentially higher residues in parsley, dried leaves, tolerance level residues for subgroup 4A were used for this commodity.

**Processing Factors:** The combined triflumizole residues did not concentrate in pineapple process residue and juice (D346779, W. Cutchin, 01-OCT-2008). There is no evidence that triflumizole residues concentrate in raisins, grape juice, apple juice, and apple sauce (DEB Nos. 4277 and 7278, S. Malak, 3/16/89); therefore, the DEEM™ default concentration factors for these processed commodities were reduced to 1. The dietary risk assessments used DEEM™ default concentration factors for all other processed commodities, except tomato. No tomato processed commodities were included in the assessments since triflumizole use is limited to greenhouse tomato varieties, and these are not processed for economic reasons.

The USDA Pesticide Data Program (PDP) monitored pesticide residues in catfish in 2008, 2009, and 2010. In general, pesticide residues would not be expected to be found in fish unless the pesticide bioaccumulates or has an aquatic use. To determine whether or not residues are present in fish, HED now routinely checks PDP monitoring data regardless of the pesticide's uses and physicochemical properties. In 2008, PDP analyzed 552 catfish samples for triflumizole, reporting no detections. As a result, residues in fish were not included in the assessment.

### III. Percent Crop Treated Information

Updated percent crop treated (%CT) information was provided by the Office of Pesticide Program's (OPP's) Biological and Economic Analysis Division (BEAD) for apples, cantaloupes, cherries, cucumbers, grapes, hazelnuts (filberts), honeydew melons, pears, pumpkins, squash, strawberries, and watermelons in a Screening Level Usage Analysis (SLUA) dated 30-JAN-2013. Although BEAD provided maximum and average %CT information, only the average %CT values were utilized in the dietary exposure analysis.

The following average percent crop treated estimates (30-JAN-2013 Triflumizole SLUA) were used in the chronic dietary risk assessments for the following crops that are registered for triflumizole: apple: 25%; cantaloupe: 10%; cherry: 25%; cucumber: 2.5%; filbert: 5%; grape: 5%; honeydew: 15%; pear: 45%; pumpkin: 5%; squash: 5%; strawberry: 25%; and watermelon: 5%.

### IV. Drinking Water Data

The Environmental Fate and Effects Division (EFED) provided estimated drinking water concentrations (EDWCs) to include the degradates containing the 4-chloro-2-trifluoromethylaniline moiety (MARC; DP Num: 280869, J. Tyler, 3/13/02): "Tier II Drinking Water Assessment to Establish Tolerances of Triflumizole on Greenhouse Vegetables (Cucumber and Tomato), Pome Fruit Subgroup 11-10, Small Fruit Vine Climbing Subgroup 13-07F and Low Growing Berry Subgroup 13-07G (excluding Cranberry)" 5/20/13, C.M. Koper, S. Sankula, and E. Odenkirchen, D407680. Water residues were incorporated in DEEM-FCID directly into the food categories "water, direct, all sources" and "water, indirect, all sources."

For groundwater, SCI-GROW and PRZM-GW simulations were executed. PRZM-GW

concentration estimates were less than those generated from SCI-GROW. For surface water, the Pesticide Root Zone Model-Exposure Analysis Modeling System (PRZM-EXAMS) model was used to derive the surface water EDWC. Maximum acute and chronic EDWC values were obtained using the maximum application scenarios for ornamentals and cherries, respectively. The ground water EDWC was 3.1 ppb. The acute EDWC of 98 ppb was taken from the 1-in-10 year annual maximum concentration calculated by PRZM-EXAMS. Likewise, the chronic EDWC of 22 ppb was taken from the 1-in-10 year annual mean concentration calculated by PRZM-EXAMS. Consequently, the dietary (food + water) risk assessments used residue values of 0.098 and 0.022 ppm for the acute and non-cancer chronic assessments, respectively.

Additional information regarding water models and their descriptions are available at the EPA internet site: <http://www.epa.gov/oppefed1/models/water/>.

## V. DEEM-FCID™ Program and Consumption Information

Triflumizole acute and chronic dietary exposure assessments were conducted using the DEEM-FCID, Version 3.16, which incorporates 2003-2008 food consumption data from USDA's NHANES/WWEIA. The data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods "as consumed" (e.g., apple pie) are linked to EPA-defined food commodities (e.g., apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. For chronic exposure assessment, consumption data are averaged for the entire U.S. population and within population subgroups. However, for acute exposure assessment, consumption data are retained as individual consumption events. Based on analysis of the 2003-2008 WWEIA consumption data, which took into account dietary patterns and survey respondents, HED concluded that it is most appropriate to report risk for the following population subgroups: the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, adults 20-49, females 13-49, and adults 50-99 years old.

For a chronic dietary exposure assessment, an estimate of the residue level in each food or food-form (e.g., orange or orange juice) on the food commodity residue list is multiplied by the average daily consumption estimate for that food/food form to produce a residue intake estimate. The resulting residue intake estimate for each food/food form is summed with the residue intake estimates for all other food/food forms on the commodity residue list to arrive at the total average estimated exposure. Exposure is expressed in mg/kg body weight/day and as a percent of the cPAD. This procedure is performed for each population subgroup.

For an acute exposure assessment, individual one-day food consumption data are used on an individual-by-individual basis. The reported consumption amounts of each food item can be multiplied by a residue point estimate and summed to obtain a total daily pesticide exposure for a deterministic exposure assessment, or "matched" in multiple random pairings with residue values and then summed in a probabilistic assessment. The resulting distribution of exposures is expressed as a percentage of the aPAD on both a user (i.e., only those who reported eating relevant commodities/food forms) and a per-capita (i.e., those who reported eating the relevant commodities as well as those who did not) basis. In accordance with HED policy, per capita



exposure and risk are reported for analyses performed at all levels of refinement. However, for deterministic assessments, any significant differences in user vs. per capita exposure and risk are specifically identified and noted in the risk assessment.

## VI. Toxicological Information

The toxicity endpoints were from the most recent human-health risk assessment (D393221, S. Tadayon *et. al.*, 5/2/12), and are summarized in Table 3.

Table 3. Summary of Toxicological Doses and Endpoints for Triflumizole for Use in Dietary Exposure Risk Assessments				
Exposure/Scenario	Point of Departure	Uncertainty/FQPA Safety Factors	RfD, PAD, Level of Concern	Study and Toxicological Effects
Acute Dietary (General Population, including Infants and Children)	NOAEL = 25 mg/kg/day	UF <sub>A</sub> = 10x UF <sub>H</sub> = 10x FQPA SF= 1x	Acute RfD = 0.25 mg/kg/day	Acute Neurotoxicity – Rat LOAEL = 100 mg/kg/day based on FOB findings (neuromuscular impairment) and decreased locomotor activity.
Acute Dietary (Females 13-49 years of age)	NOAEL= 10 mg/kg/day	UF <sub>A</sub> = 10x UF <sub>H</sub> = 10x FQPA SF= 1x	Acute RfD = 0.1 mg/kg/day	Developmental Toxicity – Rat LOAEL = 35 mg/kg/day based upon decreased numbers of viable fetuses, increased dead or resorbed fetuses, increased numbers of late resorptions, decreased fetal body weight, and increased incidences of cervical ribs.
Chronic Dietary (All Populations)	LOAEL= 3.5 mg/kg/day	UF <sub>A</sub> = 10x UF <sub>H</sub> = 10x FQPA SF= 3x	Chronic RfD = 0.035 mg/kg/day  cPAD = 0.012 mg/kg/day	Combined Chronic Toxicity/Carcinog. Study - Rat Based on liver toxicity (eosinophilic foci in male rats and fatty vacuolation and inflammation and necrosis in female rats).
Cancer		Classification: “Not likely to be Carcinogenic to Humans” based on the absence of significant tumor increases in two adequate rodent carcinogenicity studies.		
Point of Departure (POD) = A data point or an estimated point that is derived from observed dose-response data and used to mark the beginning of extrapolation to determine risk associated with lower environmentally relevant human exposures. NOAEL = no observed adverse effect level. LOAEL = lowest observed adverse effect level. UF = uncertainty factor. UF <sub>A</sub> = extrapolation from animal to human (interspecies). UF <sub>H</sub> = potential variation in sensitivity among members of the human population (intraspecies). UF <sub>L</sub> = use of a LOAEL to extrapolate a NOAEL. UF <sub>S</sub> = use of a short-term study for long-term risk assessment. UF <sub>DB</sub> = to account for the absence of key data (i.e., lack of a critical study). FQPA SF = FQPA Safety Factor. PAD = population adjusted dose (a = acute, c = chronic). RfD = reference dose. MOE = margin of exposure. LOC = level of concern. N/A = not applicable.				

Separate PODs were selected for females of child-bearing age (13-49) and the general population including infants and children. For females 13-49, a developmental endpoint was selected with a NOAEL = 10 mg/kg/day and a LOAEL = 35 mg/kg/day. For the general population, the POD was the NOAEL = 25 mg/kg/day and a LOAEL = 100 mg/kg/day at which functional

observational battery (FOB) findings (neuromuscular impairment) and decreased locomotor activity were observed following a single exposure. An uncertainty factor of 100x (10x for interspecies extrapolation and 10x intraspecies variation) was applied to derive the acute Reference Doses (RfD) for these population groups. The chronic dietary endpoint is based on liver toxicity observed at 3.5 mg/kg/day, the lowest dose tested in the combined chronic toxicity/carcinogenicity study in rats; a NOAEL was not established. An uncertainty factor of 300x (10x for interspecies extrapolation, 10x intraspecies extrapolation and 3x for the use of a LOAEL (UF<sub>L</sub>)) was used to derive the chronic RfD.

The Agency has determined that a 3x for the use of a LOAEL (as opposed to the default 10x) is adequate based on the following weight of evidence considerations:

- The most sensitive endpoint in the target organ (liver) for this class of compounds (conazole fungicide) is used for assessing chronic risk.
- There is low concern for the observed effects since the observed lesions (eosinophilic foci in male rats and fatty vacuolation and inflammation and necrosis in female rats) did not progress into malignancy.
- The available data do not show this chemical to be a potent toxicant following short- and long-term dietary exposure since clear NOAELs were established in all the other studies such as the reproduction (3.5 mg/kg/day), subchronic rat (15.3 mg/kg/day), subchronic mouse (33.1 mg/kg/day), chronic dog 10 mg/kg/day) and the mouse carcinogenicity (16.2 mg/kg/day) studies.
- The extrapolated NOAEL of 1.2 mg/kg/day ( $3.5/3 = 1.2$ ) is supported by a comparable NOAEL (2.5 mg/kg/day) used for deriving the chronic RfD for a structurally-related chemical (imazalil).

## VII. Results/Discussion

As stated above, for acute and chronic assessments, the Agency is concerned when dietary risk exceeds 100% of the appropriate PAD. The DEEM-FCID™ analyses estimate the dietary exposure of the U.S. population and various population subgroups. The results reported in Table 4 are for the general U.S. Population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, adults 20-49, and adults 50-99 years old. With respect to carcinogenicity, triflumizole has been classified as “not likely to be carcinogenic to humans”; therefore, a triflumizole cancer risk assessment was not performed.

### Results of Acute Dietary (Food + Drinking Water) Exposure Analysis:

The results of the acute dietary exposure analysis are reported in Table 4. The acute dietary (food + drinking water) exposure assessment used tolerance-level residues and 100% CT for all crops. Drinking water was incorporated directly in the dietary assessment using the maximum concentration for surface water generated by the PRZM/EXAMS model. This assessment indicated that the acute dietary exposure estimates (at the 95<sup>th</sup> percentile) are below the Agency's

level of concern (<100% of the aPAD) for the general U.S. population (25% of the aPAD) and all population subgroups. Exposure was equivalent to 66% of the aPAD for the most highly exposed population subgroup (females 13-49 years old).

#### Results of Chronic Dietary (Food + Drinking Water) Exposure Analysis:

The results of the chronic dietary exposure analysis are reported in Table 4. The chronic dietary exposure assessment used ARs from average field trial residues. The assessment used % CT information where available, and 100% CT for all other crops. The chronic dietary (food + drinking water) risk assessment was conducted for the general U.S. population and various population subgroups. Drinking water was incorporated directly into the dietary assessment using the chronic (annual average) concentration for surface water generated by the PRZM/EXAMS model. This assessment concludes that the chronic dietary exposure estimates are below the Agency's level of concern (<100% of the cPAD) for the general U.S. population (21% of the cPAD) and all population subgroups. The most highly exposed population subgroup is children 1-2 years old at 39% of the cPAD.

<b>Table 4. Summary of Dietary (Food and Drinking Water) Exposure and Risk for Triflumizole.</b>						
<b>Population Subgroup</b>	<b>Acute Dietary (95th Percentile)</b>		<b>Chronic Dietary</b>		<b>Cancer</b>	
	<b>Dietary Exposure (mg/kg/day)</b>	<b>% aPAD*</b>	<b>Dietary Exposure (mg/kg/day)</b>	<b>% cPAD*</b>	<b>Dietary Exposure (mg/kg/day)</b>	<b>Risk</b>
General U.S. Population	0.063555	25	0.002571	21	N/A	N/A
All Infants (< 1 year old)	0.046533	19	0.002625	22		
<b>Children 1-2 years old</b>	0.099738	40	<b>0.004641</b>	<b>39</b>		
Children 3-5 years old	0.090227	36	0.003741	31		
Children 6-12 years old	0.058912	24	0.002281	19		
Youth 13-19 years old	0.048310	19	0.001728	14		
Adults 20-49 years old	0.062830	25	0.002563	21		
Adults 50-99 years old	0.062045	25	0.002602	22		
<b>Females 13-49 years old</b>	<b>0.066279</b>	<b>66</b>	0.002531	21		

#### **VIII. Characterization of Inputs/Outputs**

The triflumizole ARs used in the chronic dietary exposure assessment (listed in Table 2) are based on field trial data submitted by the registrant to support tolerances. Field trial residue data are generally considered by the Agency as an upper-end or a worst case scenario of possible residues, because field trials require the highest rate of application and shortest preharvest interval (PHI).

The use of 100% CT for most of the commodities that could be treated with triflumizole is a conservative measure that overestimates dietary exposure and risk from triflumizole residues.

Regarding the level of refinement of the assessments, the acute dietary assessment is unrefined in that it assumes that 100% of eligible commodities contain tolerance-level residues of triflumizole. Therefore, the acute assessment provides a conservative estimate of acute dietary risk to triflumizole which is protective of public health. The chronic dietary assessment is partially refined in that it uses anticipated residues and %CT data where available. Consequently, the chronic assessment provides a reasonably conservative assessment of potential risk to residues of triflumizole in the diet.

Should further refinements become necessary, utilization of the maximum %CT estimates provided by BEAD is recommended for the acute assessment. Also, residues of triflumizole have been analyzed by the Pesticide Data Program (PDP) in many crops as summarized in the 2008 & 2009 PDP reports. Strawberry samples had the highest triflumizole residues (0.41 ppm) and the highest percentage of detections (10%). However, no samples exceeded the established tolerance levels. Most crops had residues of triflumizole below the LOQ of 0.06 ppm in all samples.

## **IX. Conclusions**

The unrefined acute dietary (food + drinking water) assessment used tolerance-level residues in 100% of eligible commodities. Drinking water was incorporated directly in the assessment. These assessments conclude that estimated acute exposure at the 95<sup>th</sup> percentile is below the Agency's level of concern for all population subgroups evaluated.

The chronic dietary (food + drinking water) exposure assessment used ARs and %CT information as available. Drinking water was incorporated directly into the assessment. Chronic exposure estimates for all population subgroups are below the Agency's level of concern.

HED is confident that the assessments provided in this memorandum do not underestimate risk to the general U.S. population or any population subgroup.

## **X. List of Attachments**

- Attachment 1. Acute Residue Input File
- Attachment 2. Acute Results File
- Attachment 3. Chronic Residue Input File
- Attachment 4. Chronic Results File
- Attachment 5. Triflumizole SLUA

## **ATTACHMENT 1: Residue File for Acute Dietary (Food + Drinking Water)**

Filename: C:\Documents and Settings\wdonovan\My Documents\DEEM Version 3.16\128879A.R08  
 Chemical: Triflumizole  
 RfD(Chronic): .012 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day  
 RfD(Acute): .25 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day  
 Date created/last modified: 08-20-2013/08:02:24 Program ver. 3.16, 03-08-d

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1 #2		Comment
0401005000	4A	Amaranth, leafy	35.000000	1.000	1.000	
0401018000	4A	Arugula	35.000000	1.000	1.000	
0401104000	4A	Chrysanthemum, garland	35.000000	1.000	1.000	
0401133000	4A	Cress, garden	35.000000	1.000	1.000	
0401134000	4A	Cress, upland	35.000000	1.000	1.000	
0401138000	4A	Dandelion, leaves	35.000000	1.000	1.000	
0401150000	4A	Endive	35.000000	1.000	1.000	
0401204000	4A	Lettuce, head	35.000000	1.000	1.000	
0401205000	4A	Lettuce, leaf	35.000000	1.000	1.000	
0401248000	4A	Parsley, leaves	35.000000	1.000	1.000	
0401313000	4A	Radicchio	35.000000	1.000	1.000	
0402367000	4B	Swiss chard	18.000000	1.000	1.000	
0501061000	5A	Broccoli	8.000000	1.000	1.000	
0501061001	5A	Broccoli-babyfood	8.000000	1.000	1.000	
0501062000	5A	Broccoli, Chinese	8.000000	1.000	1.000	
0501064000	5A	Brussels sprouts	8.000000	1.000	1.000	
0501069000	5A	Cabbage	8.000000	1.000	1.000	
0501071000	5A	Cabbage, Chinese, napa	8.000000	1.000	1.000	
0501072000	5A	Cabbage, Chinese, mustard	8.000000	1.000	1.000	
0501083000	5A	Cauliflower	8.000000	1.000	1.000	
0501196000	5A	Kohlrabi	8.000000	1.000	1.000	
0502063000	5B	Broccoli raab	40.000000	1.000	1.000	
0502070000	5B	Cabbage, Chinese, bok choy	40.000000	1.000	1.000	
0502117000	5B	Collards	40.000000	1.000	1.000	
0502194000	5B	Kale	40.000000	1.000	1.000	
0502229000	5B	Mustard greens	40.000000	1.000	1.000	
0502318000	5B	Rape greens	40.000000	1.000	1.000	
0502389000	5B	Turnip, greens	40.000000	1.000	1.000	
0801374000	8A	Tomatillo	1.500000	1.000	1.000	
0801375000	8A	Tomato	1.500000	1.000	1.000	
0801380000	8A	Tomato, Tree	1.500000	1.000	1.000	
0901075000	9A	Cantaloupe	0.800000	1.000	1.000	
0901187000	9A	Honeydew melon	0.800000	1.000	1.000	
0901399000	9A	Watermelon	0.800000	1.000	1.000	
0901400000	9A	Watermelon, juice	0.800000	1.000	1.000	
0902021000	9B	Balsam pear	0.800000	1.000	1.000	
0902088000	9B	Chayote, fruit	0.800000	1.000	1.000	
0902102000	9B	Chinese waxgourd	0.800000	1.000	1.000	
0902135000	9B	Cucumber	0.800000	1.000	1.000	
0902308000	9B	Pumpkin	0.800000	1.000	1.000	
0902309000	9B	Pumpkin, seed	0.800000	1.000	1.000	
0902356000	9B	Squash, summer	0.800000	1.000	1.000	
0902356001	9B	Squash, summer-babyfood	0.800000	1.000	1.000	
0902357000	9B	Squash, winter	0.800000	1.000	1.000	
0902357001	9B	Squash, winter-babyfood	0.800000	1.000	1.000	
1100007000	11	Apple, fruit with peel	0.500000	1.000	1.000	
1100008000	11	Apple, peeled fruit	0.500000	1.000	1.000	
1100008001	11	Apple, peeled fruit-babyfood	0.500000	1.000	1.000	
1100009000	11	Apple, dried	0.500000	8.000	1.000	
1100009001	11	Apple, dried-babyfood	0.500000	8.000	1.000	
1100010000	11	Apple, juice	0.500000	1.000	1.000	
1100010001	11	Apple, juice-babyfood	0.500000	1.000	1.000	
1100011000	11	Apple, sauce	0.500000	1.000	1.000	
1100011001	11	Apple, sauce-babyfood	0.500000	1.000	1.000	
1100129000	11	Crabapple	0.500000	1.000	1.000	
1100210000	11	Loquat	0.500000	1.000	1.000	
1100266000	11	Pear	0.500000	1.000	1.000	
1100266001	11	Pear-babyfood	0.500000	1.000	1.000	
1100267000	11	Pear, dried	0.500000	6.250	1.000	
1100268000	11	Pear, juice	0.500000	1.000	1.000	

1100268001	11	Pear, juice-babyfood	0.500000	1.000	1.000	
1100310000	11	Quince	0.500000	1.000	1.000	
1201090000	12A	Cherry	1.500000	1.000	1.000	
1201090001	12A	Cherry-babyfood	1.500000	1.000	1.000	
1201091000	12A	Cherry, juice	1.500000	1.500	1.000	
1201091001	12A	Cherry, juice-babyfood	1.500000	1.500	1.000	
1302057000	13B	Blueberry	2.000000	1.000	1.000	
1302057001	13B	Blueberry-babyfood	2.000000	1.000	1.000	
1302174000	13B	Gooseberry	2.500000	1.000	1.000	
1304175000	13D	Grape	2.500000	1.000	1.000	
1304176000	13D	Grape, juice	2.500000	1.000	1.000	
1304176001	13D	Grape, juice-babyfood	2.500000	1.000	1.000	
1304179000	13D	Grape, wine and sherry	2.500000	1.000	1.000	
1307359000	13G	Strawberry	2.000000	1.000	1.000	
1307359001	13G	Strawberry-babyfood	2.000000	1.000	1.000	
1307360000	13G	Strawberry, juice	2.000000	1.000	1.000	
1307360001	13G	Strawberry, juice-babyfood	2.000000	1.000	1.000	
1400155000	14	Hazelnut	0.050000	1.000	1.000	
1400156000	14	Hazelnut, oil	0.050000	1.000	1.000	
1901118000	19A	Cilantro, leaves	35.000000	1.000	1.000	
1901118001	19A	Cilantro, leaves-babyfood	35.000000	1.000	1.000	
1901249000	19A	Parsley, dried leaves	35.000000	1.000	1.000	
1901249001	19A	Parsley, dried leaves-babyfood	35.000000	1.000	1.000	
3100046000	31	Beef, meat byproducts	0.200000	1.000	1.000	
3100046001	31	Beef, meat byproducts-babyfood	0.200000	1.000	1.000	
3100047000	31	Beef, fat	0.100000	1.000	1.000	
3100047001	31	Beef, fat-babyfood	0.100000	1.000	1.000	
3200170000	32	Goat, meat byproducts	0.200000	1.000	1.000	
3200171000	32	Goat, fat	0.100000	1.000	1.000	
3500340000	35	Sheep, meat byproducts	0.200000	1.000	1.000	
3500341000	35	Sheep, fat	0.100000	1.000	1.000	
3500341001	35	Sheep, fat-babyfood	0.100000	1.000	1.000	
8601000000	86A	Water, direct, all sources	0.098000	1.000	1.000	D40768
Full comment: D407680, 5/20/13						
8602000000	86B	Water, indirect, all sources	0.098000	1.000	1.000	D40768
Full comment: D407680, 5/20/13						
9500074000	O	Canistel	2.500000	1.000	1.000	
9500177000	O	Grape, leaves	2.500000	1.000	1.000	
9500178000	O	Grape, raisin	2.500000	1.000	1.000	
9500188000	O	Hop	50.000000	1.000	1.000	
9500215000	O	Mango	2.500000	1.000	1.000	
9500215001	O	Mango-babyfood	2.500000	1.000	1.000	
9500216000	O	Mango, dried	2.500000	1.000	1.000	
9500217000	O	Mango, juice	2.500000	1.000	1.000	
9500217001	O	Mango, juice-babyfood	2.500000	1.000	1.000	
9500245000	O	Papaya	2.500000	1.000	1.000	
9500245001	O	Papaya-babyfood	2.500000	1.000	1.000	
9500246000	O	Papaya, dried	2.500000	1.800	1.000	
9500247000	O	Papaya, juice	2.500000	1.500	1.000	
9500279000	O	Pineapple	4.000000	1.000	1.000	
9500279001	O	Pineapple-babyfood	4.000000	1.000	1.000	
9500280000	O	Pineapple, dried	4.000000	5.000	1.000	
9500281000	O	Pineapple, juice	4.000000	1.000	1.000	
9500281001	O	Pineapple, juice-babyfood	4.000000	1.000	1.000	
9500333000	O	Sapote, Mamey	2.500000	1.000	1.000	



**ATTACHMENT 2: Acute Dietary (Food + Water) Exposure Analysis**

U.S. EPA Ver. 3.16, 03-08-d  
 DEEM-FCID ACUTE Analysis for TRIFLUMIZOLE NHANES 2003-2008 2-Day  
 Residue file: 128879A.R08 Adjustment factor #2 NOT used.  
 Analysis Date: 08-20-2013/09:07:44 Residue file dated: 08-20-2013/08:02:24  
 Acute Pop Adjusted Dose (aPAD) varies with population; see individual reports  
 RAC/FF intake summed over 24 hours  
 Run Comment: ""

Summary calculations--per capita:

	95th Percentile Exposure	% aPAD	99th Percentile Exposure	% aPAD	99.9th Percentile Exposure	% aPAD
	-----	-----	-----	-----	-----	-----
Total US Population:	0.063555	25.42	0.116822	46.73	0.216316	86.53
All Infants:	0.046533	18.61	0.109217	43.69	0.277180	110.87
Children 1-2:	0.099738	39.90	0.185510	74.20	0.408983	163.59
Children 3-5:	0.090227	36.09	0.184659	73.86	0.265504	106.20
Children 6-12:	0.058912	23.56	0.117290	46.92	0.190734	76.29
Youth 13-19:	0.048310	19.32	0.099460	39.78	0.251838	100.74
Adults 20-49:	0.062830	25.13	0.114721	45.89	0.211577	84.63
Adults 50-99:	0.062045	24.82	0.105279	42.11	0.193090	77.24
Female 13-49:	0.066279	66.28	0.126576	126.58	0.220461	220.46

**ATTACHMENT 3: Residue File for Chronic Dietary (Food + Drinking Water)**

Filename: C:\Documents and Settings\wdonovan\My Documents\DEEM Version 3.16\128879C.R08

Chemical: Triflumizole

RfD(Chronic): .012 mg/kg bw/day NOEL(Chronic): 0 mg/kg bw/day

RfD(Acute): .25 mg/kg bw/day NOEL(Acute): 0 mg/kg bw/day

Date created/last modified: 08-20-2013/08:57:49 Program ver. 3.16, 03-08-d

Comment: Triflumizole chronic ARS %CT

EPA Code	Crop Grp	Commodity Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
0401005000	4A	Amaranth, leafy	11.100000	1.000	1.000	
0401018000	4A	Arugula	11.100000	1.000	1.000	
0401104000	4A	Chrysanthemum, garland	11.100000	1.000	1.000	
0401133000	4A	Cress, garden	11.100000	1.000	1.000	
0401134000	4A	Cress, upland	11.100000	1.000	1.000	
0401138000	4A	Dandelion, leaves	11.100000	1.000	1.000	
0401150000	4A	Endive	11.100000	1.000	1.000	
0401204000	4A	Lettuce, head	2.970000	1.000	1.000	
0401205000	4A	Lettuce, leaf	11.100000	1.000	1.000	
0401248000	4A	Parsley, leaves	11.100000	1.000	1.000	
0401313000	4A	Radicchio	2.970000	1.000	1.000	
0402367000	4B	Swiss chard	5.480000	1.000	1.000	
0501061000	5A	Broccoli	1.790000	1.000	1.000	
0501061001	5A	Broccoli-babyfood	1.790000	1.000	1.000	
0501062000	5A	Broccoli, Chinese	1.790000	1.000	1.000	
0501064000	5A	Brussels sprouts	0.740000	1.000	1.000	
0501069000	5A	Cabbage	0.740000	1.000	1.000	
0501071000	5A	Cabbage, Chinese, napa	0.740000	1.000	1.000	
0501072000	5A	Cabbage, Chinese, mustard	0.740000	1.000	1.000	
0501083000	5A	Cauliflower	1.790000	1.000	1.000	
0501196000	5A	Kohlrabi	0.740000	1.000	1.000	
0502063000	5B	Broccoli raab	7.720000	1.000	1.000	
0502070000	5B	Cabbage, Chinese, bok choy	7.720000	1.000	1.000	
0502117000	5B	Collards	7.720000	1.000	1.000	
0502194000	5B	Kale	7.720000	1.000	1.000	
0502229000	5B	Mustard greens	7.720000	1.000	1.000	
0502318000	5B	Rape greens	7.720000	1.000	1.000	
0502389000	5B	Turnip, greens	7.720000	1.000	1.000	
0801374000	8A	Tomatillo	0.590000	1.000	1.000	
0801375000	8A	Tomato	0.590000	1.000	1.000	
0801380000	8A	Tomato, Tree	0.590000	1.000	1.000	
0901075000	9A	Cantaloupe	0.170000	1.000	0.100	SLUA o
		Full comment: SLUA of Jan 2013				
0901187000	9A	Honeydew melon	0.170000	1.000	0.150	SLUA o
		Full comment: SLUA of Jan 2013				
0901399000	9A	Watermelon	0.170000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
0901400000	9A	Watermelon, juice	0.170000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
0902021000	9B	Balsam pear	0.250000	1.000	1.000	
0902088000	9B	Chayote, fruit	0.140000	1.000	1.000	
0902102000	9B	Chinese waxgourd	0.250000	1.000	1.000	
0902135000	9B	Cucumber	0.250000	1.000	0.025	SLUA o
		Full comment: SLUA of Jan 2013				
0902308000	9B	Pumpkin	0.140000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
0902309000	9B	Pumpkin, seed	0.140000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
0902356000	9B	Squash, summer	0.140000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
0902356001	9B	Squash, summer-babyfood	0.140000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
0902357000	9B	Squash, winter	0.140000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
0902357001	9B	Squash, winter-babyfood	0.140000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
1100007000	11	Apple, fruit with peel	0.140000	1.000	0.250	SLUA o
		Full comment: SLUA of Jan 2013				

1100008000	11	Apple, peeled fruit	0.140000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100008001	11	Apple, peeled fruit-babyfood	0.140000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100009000	11	Apple, dried	0.140000	8.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100009001	11	Apple, dried-babyfood	0.140000	8.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100010000	11	Apple, juice	0.140000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100010001	11	Apple, juice-babyfood	0.140000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100011000	11	Apple, sauce	0.140000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100011001	11	Apple, sauce-babyfood	0.140000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1100129000	11	Crabapple	0.140000	1.000	1.000		
1100210000	11	Loquat	0.230000	1.000	1.000		
1100266000	11	Pear	0.230000	1.000	0.450	SLUA	o
		Full comment: SLUA of Jan 2013					
1100266001	11	Pear-babyfood	0.230000	1.000	0.450	SLUA	o
		Full comment: SLUA of Jan 2013					
1100267000	11	Pear, dried	0.230000	6.250	0.450	SLUA	o
		Full comment: SLUA of Jan 2013					
1100268000	11	Pear, juice	0.230000	1.000	0.450	SLUA	o
		Full comment: SLUA of Jan 2013					
1100268001	11	Pear, juice-babyfood	0.230000	1.000	0.450	SLUA	o
		Full comment: SLUA of Jan 2013					
1100310000	11	Quince	0.230000	1.000	1.000		
1201090000	12A	Cherry	0.660000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1201090001	12A	Cherry-babyfood	0.660000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1201091000	12A	Cherry, juice	0.660000	1.500	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1201091001	12A	Cherry, juice-babyfood	0.660000	1.500	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1302057000	13B	Blueberry	0.530000	1.000	1.000		
1302057001	13B	Blueberry-babyfood	0.530000	1.000	1.000		
1302174000	13B	Gooseberry	0.550000	1.000	1.000		
1304175000	13D	Grape	0.550000	1.000	0.050	SLUA	o
		Full comment: SLUA of Jan 2013					
1304176000	13D	Grape, juice	0.550000	1.000	0.050	SLUA	o
		Full comment: SLUA of Jan 2013					
1304176001	13D	Grape, juice-babyfood	0.550000	1.000	0.050	SLUA	o
		Full comment: SLUA of Jan 2013					
1304179000	13D	Grape, wine and sherry	0.550000	1.000	0.050	SLUA	o
		Full comment: SLUA of Jan 2013					
1307359000	13G	Strawberry	0.530000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1307359001	13G	Strawberry-babyfood	0.530000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1307360000	13G	Strawberry, juice	0.530000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1307360001	13G	Strawberry, juice-babyfood	0.530000	1.000	0.250	SLUA	o
		Full comment: SLUA of Jan 2013					
1400155000	14	Hazelnut	0.050000	1.000	0.050	SLUA	o
		Full comment: SLUA of Jan 2013					
1400156000	14	Hazelnut, oil	0.050000	1.000	0.050	SLUA	o
		Full comment: SLUA of Jan 2013					
1901118000	19A	Cilantro, leaves	11.100000	1.000	1.000		
1901118001	19A	Cilantro, leaves-babyfood	11.100000	1.000	1.000		
1901249000	19A	Parsley, dried leaves	35.000000	1.000	1.000		
1901249001	19A	Parsley, dried leaves-babyfood	35.000000	1.000	1.000		
3100046000	31	Beef, meat byproducts	0.200000	1.000	1.000		
3100046001	31	Beef, meat byproducts-babyfood	0.200000	1.000	1.000		
3100047000	31	Beef, fat	0.100000	1.000	1.000		
3100047001	31	Beef, fat-babyfood	0.100000	1.000	1.000		
3200170000	32	Goat, meat byproducts	0.200000	1.000	1.000		
3200171000	32	Goat, fat	0.100000	1.000	1.000		
3500340000	35	Sheep, meat byproducts	0.200000	1.000	1.000		

3500341000	35	Sheep, fat	0.100000	1.000	1.000	
3500341001	35	Sheep, fat-babyfood	0.100000	1.000	1.000	
8601000000	86A	Water, direct, all sources	0.022000	1.000	1.000	D40768
		Full comment: D407680, 5/20/13				
8602000000	86B	Water, indirect, all sources	0.022000	1.000	1.000	D40768
		Full comment: D407680, 5/20/13				
9500074000	O	Canistel	0.630000	1.000	1.000	
9500177000	O	Grape, leaves	0.550000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
9500178000	O	Grape, raisin	0.550000	1.000	0.050	SLUA o
		Full comment: SLUA of Jan 2013				
9500188000	O	Hop	14.400000	1.000	1.000	
9500215000	O	Mango	0.630000	1.000	1.000	
9500215001	O	Mango-babyfood	0.630000	1.000	1.000	
9500216000	O	Mango, dried	0.630000	1.000	1.000	
9500217000	O	Mango, juice	0.630000	1.000	1.000	
9500217001	O	Mango, juice-babyfood	0.630000	1.000	1.000	
9500245000	O	Papaya	0.630000	1.000	1.000	
9500245001	O	Papaya-babyfood	0.630000	1.000	1.000	
9500246000	O	Papaya, dried	0.630000	1.800	1.000	
9500247000	O	Papaya, juice	0.630000	1.500	1.000	
9500279000	O	Pineapple	2.170000	1.000	1.000	
9500279001	O	Pineapple-babyfood	2.170000	1.000	1.000	
9500280000	O	Pineapple, dried	2.170000	5.000	1.000	
9500281000	O	Pineapple, juice	2.170000	1.000	1.000	
9500281001	O	Pineapple, juice-babyfood	2.170000	1.000	1.000	
9500333000	O	Sapote, Mamey	0.630000	1.000	1.000	

**ATTACHMENT 4: Chronic Dietary (Food + Water) Exposure Analysis**

U.S. EPA  
 DEEM-FCID Chronic analysis for TRIFLUMIZOLE  
 Residue file name: C:\Documents and Settings\wdonovan\My Documents\DEEM Version 3.16\128879C.R08

Ver. 3.16, 03-08-d

NHANES 2003-2008 2-day

Adjustment factor #2 used.

Analysis Date 08-20-2013/09:05:53 Residue file dated: 08-20-2013/08:57:49

Reference dose (RfD, Chronic) = .012 mg/kg bw/day

COMMENT 1: Triflumizole chronic ARs %CT

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Total exposure by population subgroup

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Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
Total US Population	0.002571	21.4%
Hispanic	0.002466	20.5%
Non-Hisp-White	0.002589	21.6%
Non-Hisp-Black	0.002526	21.1%
Non-Hisp-Other	0.002723	22.7%
Nursing Infants	0.001322	11.0%
Non-Nursing Infants	0.003207	26.7%
Female 13+ PREG	0.002466	20.5%
Children 1-6	0.004045	33.7%
Children 7-12	0.002045	17.0%
Male 13-19	0.001625	13.5%
Female 13-19/NP	0.001831	15.3%
Male 20+	0.002418	20.1%
Female 20+/NP	0.002730	22.7%
Seniors 55+	0.002512	20.9%
All Infants	0.002625	21.9%
Female 13-50	0.002530	21.1%
Children 1-2	0.004641	38.7%
Children 3-5	0.003741	31.2%
Children 6-12	0.002281	19.0%
Youth 13-19	0.001728	14.4%
Adults 20-49	0.002563	21.4%
Adults 50-99	0.002602	21.7%
Female 13-49	0.002531	21.1%

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**ATTACHMENT 5. Triflumizole SLUA****January 30, 2013**

**Screening Level Estimates of Agricultural Uses of Triflumizole (128879)**  
**Sorted Alphabetically**  
**(Reporting Timeframe: 2004-2011)**

			Percent Crop Treated	
Crop		Lbs. A.I.	Average	Maximum
1	Apples	40,000	25	40
2	Brussels Sprouts *	<500	N/C	N/C
3	Cantaloupes	2,000	10	25
4	Cherries	10,000	25	35
5	Cucumbers	<500	<2.5	10
6	Grapes	20,000	5	15
7	Hazelnuts (Filberts)	<500	5	15
8	Honeydews	1,000	15	30
9	Pears	10,000	45	60
10	Pumpkins	1,000	5	15
11	Squash	1,000	5	10
12	Strawberries	5,000	25	40
13	Watermelons	2,000	5	10

All numbers rounded.

&lt;500 Less than 500 pounds of active ingredient

&lt;2.5 Less than 2.5 percent of crop treated

\* Based on CA DPR data only/ N/C = not calculated, only lbs. A.I. available

SLUA data sources include:

USDA-NASS (United States Department of Agriculture's National Agricultural Statistics Service)

Private Pesticide Market Research

California DPR (Department of Pesticide Regulation)

These results reflect amalgamated data developed by the Agency and are releasable to the public.